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ABSTRACT

This paper describes a study of students' perceptions of the impact of accessibility and interactivity on successful distance education in the Health Professions. The study utilized both quantitative and qualitative data to determine how students perceived issues of accessibility and interactivity affecting their success in distance courses. The research found that both accessibility and interactivity are crucial to students' success in and satisfaction with distance education courses. In fact, issues of accessibility and interactivity are interconnected to such an extent that they can work together to either support or detract from students' success. Students, instructors, staff, departments, and the university administration must work together as a team to create the most readily accessible and interactive distance education possible. (Contains 37 references.) (Author)

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Accessible Adult Learning in the Health Professions: Interactive Uses of Distance Technology

Abstract: This paper describes a study of students' perceptions of the impact of accessibility and interactivity on successful distance education in the Health Professions. The study utilized both quantitative and qualitative data to determine how students perceived issues of accessibility and interactivity affecting their success in distance courses. Our research found that both accessibility and interactivity are crucial to students' success in and satisfaction with distance education courses. In fact, issues of accessibility and interactivity are interconnected to such an extent that they can work together to either support or detract from students' success. Students, instructors, staff, departments and the university administration must work together as a team to create the most readily accessible and interactive distance education possible.

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I. Introduction

In our post-industrial information society, knowledge accumulates quickly and needs to be disseminated quickly, and at frequent intervals, to those who need it. As a result, education can never end. Life-long learning must be encouraged and facilitated to allow for on-going professional development and connections with global learning forums. This process benefits both the learners and the communities they serve. This is particularly true in the health professions.

Research has shown that potential students in the health professions often fall through the gaps in traditional learning environments. For example, rural learners, adult learners, and disabled learners often find it impossible to leave their homes to seek further education. They are often located too far from a learning institution, or are unable to take the time to leave jobs or dependents to seek further education. Those people who do not have the opportunity to access education at a distance to up-date their knowledge and skill sets and further their career goals, are at a disadvantage.

Distance education, increasingly offered via the Internet, provides a solution to this need. The ability to access the technology utilized in distance education is a key component in delivering a successful on-line educational programme but barriers to access remain. As recently as 1996 Angus Reid reported that only 39% of women, compared to 61 percent of men, had Internet access. (Joseph, 54, originally cited in Menzies, 1998) Many rural dwellers still do not have access to high-speed Internet, while disabled students are isolated by web interfaces that do not recognize their particular needs.

The challenge for educators is to retain quality in education whilst extending accessibility to students who would otherwise remain at arms length from their programmes. There has been a tendency to assume that education in the health professions must necessarily be on-site to deal with the challenge of linking theoretical knowledge with the practical development of competence. Efforts have been undertaken by distance education instructors to promote the interactivity encouraged in the live classroom in the virtual classroom. Experts agree that the best way to accomplish this goal is to make the virtual classroom experience highly collaborative and to promote discussions between students as well as between students and the instructor. This has been one of the key challenges in providing successful education in the health professions.

A review of the most current literature on issues of accessibility and interactivity in health professions distance education confirms the importance of these two key themes in creating a successful programme. While the literature is generally positive about distance education, the purpose of research in this area is to present solutions to recurrent difficulties encountered by many programmes. Some researchers are looking towards educating instructors in new pedagogical techniques suitable for distance education, others are involved in developing and testing computer-based systems that will assist student learning at a distance. Some researchers are also beginning to turn to their students for perspectives, advice and insight about their perceived success and satisfaction with distance learning (Cartwright, DeBourgh, Draude & Brace, Lesh et al., Mamary, Nelson, Thiele).

The ideal health professions course provides plenty of opportunity for students to communicate, cooperate and collaborative with one another. Interactivity between students, and between the instructor and students, promotes community and connection within the course creating support-systems which facilitate learning. (Geer, Liaw & Huang) Group work mimics the real-world experience of health professionals who must often work in teams to understand and cope with the workings of many complex systems including the human mind and body, the administration and management of staff and patients, and the moral and ethical dilemmas they inevitably encounter. (Niederhauser, Spector & Davidson, Orrill, Lankard Brown). Thiele notes that "the current and future health care environment demands a collaborative approach to work. Modeling this expectation in the nursing curriculum provides essential preparation for the multi-disciplinary partnerships that are a requisite for providing quality care, now and in the future" (Thiele, 202).

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Despite the advantages the technology has to offer, accessing a virtual course rather than attending a live class is often fraught with difficulties mostly caused by the technology, specifically low-level computer literacy. Some students are afraid of the technology and/or lack the technological skills they need to access and complete the course. This problem can be exacerbated

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by the lack of the instructors' technological skills or the lack of technological support for both instructors and students from the institution. In some cases, the inability of the institution to supply the necessary technology, to upgrade old systems, or to provide technicians who are capable of setting up complex systems due to financial constraints, affects the access students and instructors have to distance education possibilities. (OLT, Muirhead, Terpstra in *Distance Learning*). Administrators, technical-support providers, and library personnel all need to be trained to assist distance education students. Faculty need to be supplied with access to technological and pedagogical professional development. (OLT, Muirhead, Sykes Berry & Mullaly-Quijas in *Distance Learning*, Franklin in *Distance Learning*) They also need to offer their courses using a variety of learning technologies to facilitate accessibility. (Lankard Brown, Cragg & Doucette in *Distance Learning*) Furthermore, students need to assist themselves by taking computer and orientation sessions before beginning a course to assure they have the requisite skills necessary. Students also need to be willing to problem-solve with the technology in the same way as they problem-solve issues that they face in their daily professional lives (Clarke).

According to the literature, achieving student success and satisfaction with accessibility and interactivity are key components in attaining overall success and satisfaction with distance learning. Studies show that good pedagogy that promotes collaborative learning and communicates expectations clearly to students can enable students to enjoy and succeed in a course despite the technological difficulties they may encounter. (DeBourgh) Ideally, though, the smooth working of technological systems and support services facilitates the ability of students to interact with the course, the instructor, and other students and thus to obtain the maximum benefits of the health professions programmes offered by distance.

II. Specifics of the Dalhousie Health Professions Study:

Five departments within the Health Professions Faculty at Dalhousie University, Nova Scotia, Canada (all offering a varying number of distance education courses and programmes at the undergraduate and graduate level) collaborated to determine their students' perceived satisfaction with the accessibility and interactivity of their distance education.

This Project was conducted in concert with the following internal partners at Dalhousie Univesity: Office of Instructional Development and Technology, Atlantic Health Promotion Research Centre, and the Academic Computing Services. The following external partners were involved: Office of Learning Technologies of Human Resources Development Canada, and the Workers' Compensation Board of Nova Scotia.

ii. Key Themes

Accessibility:
The different ways in which the technology of distance education is available to learners.

More specifically, ***accessibility*** refers to the students' ability to gain easy access to the course, to be able to access support systems to aid with technological difficulties, and to have access to a variety of ways to interact with the university administration, the course, and the learning process.

Interactivity:
The inter-play and exchange in which individuals and groups (learner-learner, instructor-learner) influence each other.

More specifically, ***interactivity*** referred to the receptivity of students and faculty to the use of different technologies (chat-rooms, discussion boards, teleconferencing, email) and methods (social rapport building activities, course design, the nature of the communication in a course) to communicate with one another. The term interactivity also referred to students' and faculty's perception of these technologies in enhancing or detracting from their opportunity for discussions and collaborations and the usefulness of these interactions in their learning process.

iii. Student Demographics

In the Faculty of Health Professions at Dalhousie University, the demographics of the adult distance learning were in accordance with those generally described in the literature. Based on survey data, the majority of students were:

- female
- between the ages of 25 and 55
- employed full-time while maintaining part-time student status
- accessing academic courses most often during the evening
- responsible for caring for dependents at home

A significant number of students were rural dwellers.

3. Methodology

i. The Objectives of the Project were:

I. To analyze technology and learning needs identified by adults at the beginning of distance education courses in four Schools and the Disability Management Programme in Dalhousie's Faculty of Health Professions during the 1999/2000 and 2001-2002 academic year;

II. To trace and analyze the progress of learning though distance education throughout course delivery over two years in the four Schools and Disability Management Programme; and

III. To analyze summative evaluation data, and synthesize and disseminate findings on interactive uses of distance technology in a range of entry level, graduate, and continuing education in four different health professions.

These objectives formed the basis for the development of a multi-methods study gathering both quantitative data via surveys and qualitative data via focus groups. A Survey was developed, piloted and redesigned to capture student perspectives on accessibility and interactivity in their distance learning experience in five departments of the Faculty of Health Professions. The Surveys were conducted via email, however students were assured of confidentiality. Survey #2 had a higher response rate likely due to the fact that a pre-survey message was sent reminding students about the survey. Focus Groups were held throughout the two year project. All Focus Groups were conducted by teleconference interviews by an external research group. The final survey questionnaire is described in Appendix A. Table II identifies the data collection process and Table III details the dates the methods were employed and the numbers of participants involved.

4. Results

I. Surveys

1. Students' Technological Confidence

Technological Skill	% of Students 'very confident'
email	73%
keyboarding	72%
word-processing	70%
Internet applications	22%
use of on-line library sources	17%
Trouble-Shooting	14%

2. Availability of Modes of Distance Education

Mode of Distance Education	% of Students Perceiving Mode 'very available'
Internet/Web-Based	71%
Teleconferencing	28%
Videoconferencing	2%

3. Helpfulness of Various Methods in Preparation for Course

Method of Preparation for Distance Education	% of Students Perceiving Method of Preparation 'very useful'
Instructors	43%
Manuals/Literature	31%
Friends/Family	25%
Workshops	16%

4. Opportunity and Helpfulness of Student to Student Interaction

Nature of Student to Student Communication	% of Students Perceiving 'lots of opportunity' for Student to Student Communication	% of Students Perceiving Student to Student Communication 'very helpful'
Exchange of Personal Information with Other Students	65%	53%
Communication About Non-Course Content	34%	32%
Participation in Planned or Spontaneous Activities Allowing Student to Share Ideas	48%	54%

5. Promotion of Interactivity via Designed Activities

Participants in Communication	% of Students Perceiving 'lots Opportunity' for Communication in Designed Activity	% of Students Perceiving Communication in Designed Activity 'very helpful'
Communication Between Student & Instructor	77%	73%
Communication Between Student, Instructor and Other Students	77%	75%
Small Group Work with Other Students	49%	43%

II. Statistical Inferences from Survey Data

Factor Analysis tests performed on Survey #2 resulted in some generalizations and collapsing of data. Collapsing these questions allowed us to see to what extent the demographics are determinant of variations in response to the questions on accessibility and interactivity. After the results of Survey #2 were gathered, questions relating to accessibility were not collapsible. Questions relating to interactivity were generalized.

With regard to 'technological confidence' and 'interactivity there was no statistical difference in probability values in responses between demographics, thus generalized conclusions could be reached. No significant difference was demonstrated in interactivity between number of courses, age group, urban vs. rural dweller, and between those having dependents vs. those without dependents. However, a statistical difference was shown between full-time employed survey participants and those other-wise employed or unemployed. Full-time employed participants exhibited less confidence with the technology than the other group.

No statistical inference could be made with regard to sex due to the high number of female participants and the comparatively low number of male participants.

III. The Focus Groups

Students in the Focus Groups (Focus Groups #1,2,3) believed that having computer skills was the most important skill/experience in contributing to their confidence in distance learning. Most students hadacquired their skills by trial and error either at work or at school, although a few mentioned technical support and course work. They believed that technical challenges inhibited their access to distance education, followed by scheduling difficulties when teleconferences, for example, conflicted with work or family responsibilities. They also mentioned, secondarily, that the being able to work independently and to participate in a well-organized course helped their confidence with distance education.

The students found instructors most helpful in studying by distance, providing flexible hours and deadlines, although they resented instructors who they did not feel were fully committed to distance education or who were inexperienced with distance learning. They also mentioned the support of departmental staff and technical support as being helpful to them. They were frustrated by the administrative and library barriers to studying by distance, such as dealing with the Registrars Office, double-billing, the u navailability of on-line registration, no on-line access to marks and access to materials. They asked for improvements in these areas as well as for more technological assistance. They also stressed the need for well-organized professors who would g ive more feedback.

Students reported that all distance modalities had their strengths and weaknesses. They found discussion board communication most successful, although turn-around time could be lengthy in this mode. Teleconferencing and chat-rooms were praised for the immediacy of communication but complaints were made about scheduling such interactions and the inability of some students to keep up with the flow of the discussion. Instructors varied greatly in their ability to encourage interactivity and the nature of such interactivity, but most students felt that interactivity was encouraged by instructors through such methods as

grading participation, questioning students or requiring students to post questions, or by discussing case studies or relevant web sites.

Most students felt the need for and managed to obtain some amount of informal interaction either on-line or via the phone or in-person where possible. The need to substitute some form of interaction for in-class interaction was high, but there was still often feelings of disconnectedness and loneliness amongst students. Still, students reflected that they were pleased that they had access to courses via distance.

Faculty and Staff Focus Group (Focus Groups #4,5) results supported the findings of the Student Focus Groups. They also raised issues that are specific to their perspective but which nevertheless affect the accessibility or interactivity of distance education. For example, although the departmental staff are willing and able to assist students with difficulties, this role takes up a lot of their time. For the most part, staff had been able to learn the technologies either through trial and error or via workshops to assist students but were as frustrated as the students, if not more so, by the lack of systematic administrative procedures to deal with distance education students. Faculty equally noted the ad hoc manner in which they have managed to learn the distance education technology and have adapted their classroom pedagogy for distance learning. Faculty noted the lack of university support in both contexts. Furthermore, they noted the excessive amount of time a web-based course takes to formulate and run and the lack of support or recognition such teaching work receives.

5. **Recommendations for Change**:

WHAT STUDENTS CAN DO:

- Students need to provide themselves with baseline technologies wherever possible and take workshops to up-date their technological knowledge
- Students need to consciously understand their learning styles to understand how they work best and where problems may arise for them
- Students should attend live orientations where possible, but definitely on-line orientations to the course and to the technology
- Students should be willing to commit themselves /be open to the collaborative learning process that the best on-line learning necessitates
- Students have to be prepared to work independently, manage their time, motivate themselves to get the work done
- Students should adapt technologies to suit their learning needs - ie. Taping teleconferences, printing discussions, forming partnerships with other students

WHAT INSTRUCTORS CAN DO:

- Provide orientation sessions for students - either live or on-line - technical/introductory to class - to other students and instructor
- Provide clear and detailed syllabus with course requirements and assignment instructions at the outset of the course
- assign groups on basis of time-zone, schedule, availability
- Faculty need to provide multiple weekly on-line meetings to facilitate full-time workers schedules and time-zone differences
- Commit themselves to the extra time an on-line course will take
- provide participation marks/mandatory participation to encourage student interaction on line and build community which will assist in the learning process
- make chat-room groups small so that discussion is more manageable - less threads to follow
- check up on students who have been absent/silent for too long

University Administrative Support For Faculty

- Provide professional development - in technology & pedagogy - for faculty developing on-line courses. Provide an on-line course for faculty in transforming courses into on-line courses. (This way faculty experience the on-line course from a student point-of-view, and they can learn the technology as they learn how to transform their course.)
- Provide more tech support to faculty developing on-line courses and increase faculty awareness of support systems already established on campus
- Provide a University Co-ordinator for distance learning where one person is in charge of distance learning policies and procedures and can oversee professional development of faculty in new technologies and new pedagogical approaches.
- Provide recognition for the amount of extra time an on-line course takes to prepare and conduct by faculty members, increase recognition for teaching achievement within the university

7. Future Partnerships and Catalysts for Future Research in Health Professions Distance Education

Engaging in this project has allowed members to realize that distance education has become a very legitimate method of offering academic course work in the health professions. Being part of the OLT group, including presentations to parties interested in implementing some kind of distance training, has shown that distance technology is a relevant approach to reaching persons who may not have been able to access particular courses in the past. Moreover, it is clear that the changes proposed by this project are very sustainable.

Beyond the study of accessibility and interactivity for student success and satisfaction with distance education within specific departments, other areas for further research in distance education in the health professions include:

1. A study of the gender/rural issue.
2. A study of how students research on-line in the health professions.
3. A study of how health professions students learn in a distance education environment.
4. A study of how health professions faculty adapt their pedagogy from the in-class to on- line environment.

The Project has found that issues of accessibility and interactivity are crucial to students' success in and satisfaction with distance education courses.

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